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Conceptual Design Plan for the OU 7-13/14 In Situ Grouting Project—Phase Two

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Idaho Completion Project

Bechtel BWXT Idaho, LLC

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Idaho Falls, Idaho 83415

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ABSTRACT

This conceptual design plan establishes or identifies the strategy, requirements, implementing instructions, guidelines, and expectations pertinent to managing and conducting conceptual design of facilities and processes that will be used to grout waste buried in the Subsurface Disposal Area, a radioactive landfill at the Idaho National Engineering and Environmental Laboratory.

In situ grouting using high-pressure jet grouting to form subsurface monoliths is the method selected to mitigate risks posed by fission and activation products contained in the buried waste, prevent waste subsidence, and reduce contamination migration. The grout monoliths are intended to entrain the fission and activation products, reduce water infiltration, stabilize contaminants, and provide additional ground stabilization to enhance the long-term performance of a future surface barrier cap.

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ACRONYMS

AE	architectural engineering
AR/IR	Administrative Record and Information Repository
BCP	baseline change proposal
CDR	conceptual design report
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act (42 USC § 9601 et seq., 1980)
CFA	Central Facilities Area
DMCS	Document Management Control System
DOE	U.S. Department of Energy
DOE-HQ	U.S. Department of Energy Headquarters
DOE-ID	U.S. Department of Energy Idaho Operations Office (now called NE-ID)
DWP	detailed work plan
EAC	estimate at completion
EDF	engineering design file
EDMS	Electronic Document Management System
EE/CA	engineering evaluation/cost analysis
EGS	engineering group supervisor
EPA	U.S. Environmental Protection Agency
FA	fission and activation
FFA/CO	Federal Facility Agreement and Consent Order
GDE	guide
HVAC	heating, ventilating, and air conditioning
I&C	instrumentation and control
ICP	Idaho Completion Project
ID-EM	U.S. Department of Energy Idaho Operations Office, Office of Environmental Management
INEEL	Idaho National Engineering and Environmental Laboratory

INEL	Idaho National Engineering Laboratory (now called INEEL)
ISG	in situ grouting
ISMS	Integrated Safety Management System
LLW	low-level waste
LO/TO	lockout/tagout
LST	list
MCP	management control procedure
NE-ID	U.S. Department of Energy Idaho Operations Office (formerly called DOE-ID)
ORB	Operational Review Board
OU	operable unit
PDD	program description document
PLN	plan
POD	plan of the day
PRD	program requirements document
R&D	research and development
RCC	radiation and contamination control
RMS	Resource Management System
RWMC	Radioactive Waste Management Complex
SDA	Subsurface Disposal Area
SP	subproject
SRM	Subcontractor Requirements Manual
SSC	structure, system, or component
STD	standard
T&FR	technical and functional requirement
TOC	table of contents
TRU	transuranic

TSB	Technical Support Building B
USC	*United States Code*
VE	value engineering
WAG	Waste Area Group
WBS	work breakdown structure

NOMENCLATURE

≈	approximately equal to
Be	beryllium
e.g.	for example (Latin abbreviation for “exempli gratia”)
e-mail	electronic mail
fax	facsimile
ha	hectare
i.e.	that is (abbreviation for Latin “id est”)
et al.	and others (abbreviation for Latin feminine plural “et aliae,” masculine plural “et alil,” or neutral plural “et alia”)
et seq.	and those that follow (abbreviation for Latin “et sequens”)
in situ	in position; in the natural or original position (Latin)
km	kilometer
mi	mile
RadCon	radiological control
§	section

Conceptual Design Plan for the OU 7-13/14 In Situ Grouting Project—Phase Two

1. INTRODUCTION

This conceptual design plan presents the fundamental strategy, requirements, guidelines, and expectations for conducting conceptual design of facilities and processes for the operable unit (OU) 7-13/14 In Situ Grouting (ISG) Project—Phase Two (also referred to as the "project"), which is managed by the Idaho Completion Project (ICP) prime contractor (hereafter referred to as the "company") for the U.S. Department of Energy (DOE) Idaho Operations Office, Office of Environmental Management (ID-EM).

1.1 Background

The Idaho National Engineering and Environmental Laboratory (INEEL) is a government facility managed by the DOE. The INEEL is located 51.5 km (32 mi) west of Idaho Falls, Idaho, and occupies 2,300 km^2 (890 mi^2) of the northeastern portion of the Eastern Snake River Plain.

The Radioactive Waste Management Complex (RWMC) is a restricted-access area located 11.3 km (7 mi) southwest of the Central Facilities Area (CFA) in the southwestern portion of the INEEL (see Figure 1). The RWMC encompasses approximately 72 ha (≈177 acres) (Holdren et al. 2002) and consists of two main disposal and storage areas: (1) the Transuranic Storage Area and (2) the Subsurface Disposal Area (SDA). Within these areas are smaller, specialized disposal and storage areas.

The SDA is an area of approximately 39 ha (≈97 acres) (Holdren et al. 2002) located within the RWMC. The SDA was dedicated to shallow-land disposal of solid hazardous low-level waste (LLW) and transuranic (TRU) waste. Waste Area Group (WAG) 7 is the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC § 9601 et seq., 1980) designation for the RWMC and includes the SDA (see Figure 2).

1.2 Project History

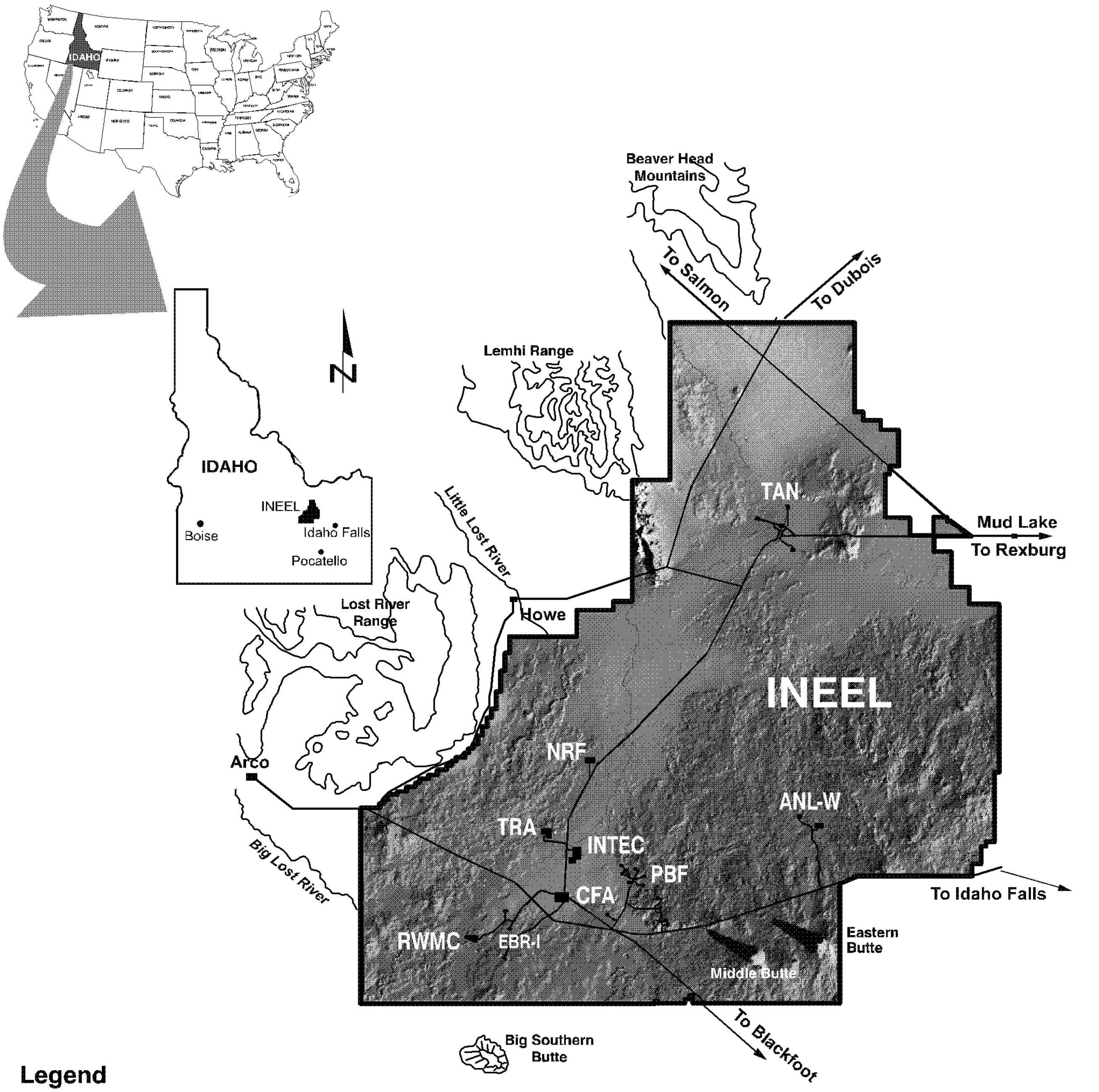
Jet grouting has been successfully demonstrated throughout the nation for at least 20 years, particularly in the oil industry and in dam projects and civil engineering projects (e.g., footings for bridges and buildings). Since 1994, the INEEL has been investigating in situ grouting (ISG) processes to treat buried waste. ISG test demonstrations at the INEEL have included:

- 1994 test that demonstrated ISG technology and evaluated the capability to contain contaminant spread using simulated Rocky Flats Plant TRU waste buried in shallow landfill pits (Loomis, Thompson, and Heiser 1995)
- Second 1994 test that demonstrated high-pressure jet grouting technology and remote retrieval (i.e., using a remote-operated backhoe) of simulated TRU waste (Loomis and Thompson 1995)
- 1995 test that demonstrated jet grouting with four proprietary grout materials and one commercially available grout (Loomis, Zdinak, and Bishop 1996)
- 1997 test in which a series of grout injections through a thrust block into disturbed soil with simulated waste produced a large monolith, which was removed intact as a unit with a front-end loader (Loomis et al. 1998a)

- Second 1997 test, which was the first radiologically hot use of ISG technology at the INEEL and resulted in successful permeation of grout into soil and waste at the SDA Acid Pit (Loomis et al. 1998b)

- 2001 test on simulated waste at the INEEL Cold Test Pit where a cementatious grout was shown to successfully form columns in INEEL soil and permeate simulated waste forms (Loomis et al. 2002).

The *Evaluation of In Site Grouting for Operable Unit 7-13/14* report, issued in 2002 (Armstrong, Arrenholz, and Weidner 2002), summarized the application of ISG to radioactively contaminated waste and soil sites across the United States and reported technology performance data where available. The document presented an analysis of jet grout-emplaced close-coupled barriers demonstrated at DOE's Hanford Site, with participation of Sandia National Laboratory and Applied Geotechnical Engineering and Construction, and full implementation at the Brookhaven Laboratory Glass Hole waste site.



Legend

ANL-W = Argonne National Laboratory-West
CFA = Central Facilities Area
EBR-I = Experimental Breeder Reactor I
INEEL = Idaho National Engineering and Environmental Laboratory
INTEC = Idaho Nuclear Technology and Engineering Center
NRF = Naval Reactors Facility
PBF = Power Burst Facility
RWMC = Radioactive Waste Management Complex
TAN = Test Area North
TRA = Test Reactor Area

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Figure 1. Map of the Idaho National Engineering and Environmental Laboratory showing locations of the Radioactive Waste Management Complex and other major Site facilities.

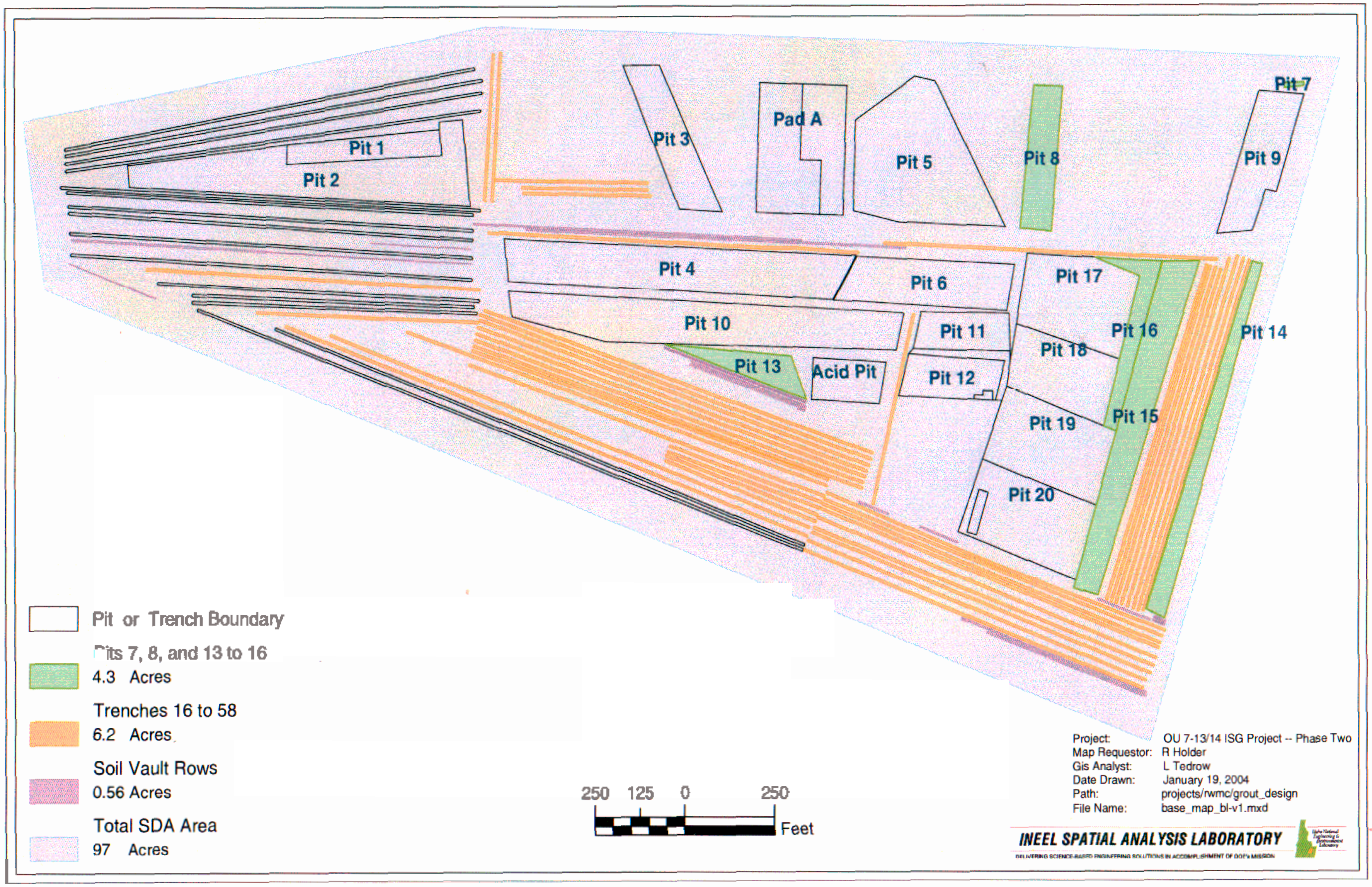

Figure 2. Schematic of the Subsurface Disposal Area highlighting pits, trenches, and soil vault rows.

1.3 Overview

Typical civil engineering applications of ISG use pressurized air or water to aid the subsurface grouting process. Other industrial applications rely on soil permeation, displacement of soil, or fractures in the media to incorporate the grout. Radiological safety concerns with using air or water in the SDA require use of a process called jet grouting. Much of the equipment used to jet grout is commercially available, but specialized safety systems may be required to control contamination spread.

To minimize the risk of mobilizing contaminants within the waste zone, the company has chosen a single-phase, non-displacement, jet grouting approach, which does not require injection of high-pressure air or free water. This approach drives a drill stem to the bottom of the waste zone, then injects grout at high pressure as the drill stem is removed. During this process, excess grout is returned to the surface along the outside of the drill stem.

Single-phase grouting in RWMC's dense surficial soils results in emplacement of grout columns of approximately two feet in diameter. Because the objective of using ISG is to encapsulate buried waste in contiguous grout columns to form immobilized waste monoliths, a capability is required to reproducibly and efficiently place grout columns.

The OU 7-13/14 ISG Project uses a two-phase approach. Phase 1 will stabilize fission and activation (FA) products located in beryllium (Be) reflector blocks buried in soil vaults and trenches. Conventional ISG technology will inject a grout to minimize the infiltration of water (reducing corrosion of the blocks) and reduce the migration of contaminants from the blocks.

This project, which constitutes Phase 2 of the OU 7-13/14 ISG Project, will focus on grouting larger areas in the SDA to either immobilize FA products that are dispersed in SDA soil vaults and trenches or stabilize the ground to improve long-term performance of a future surface barrier cap. While conventional ISG approaches may be sufficient for stabilizing specific, localized contaminants during Phase 1, those methods may not provide the productivity required to remediate large areas containing FA products during this project. The grout emplacement system for this project (Phase 2) is expected to support a large-scale grouting process that can efficiently and cost-effectively emplace grout.

Future decisions regarding remediation of TRU waste in the SDA may involve selection of ISG as an appropriate remediation methodology. This project will consider the design flexibility necessary to enable ISG materials and methodologies selected for Phase 2 non-TRU waste application to be relevant to a TRU waste application.

2. MANAGEMENT, ORGANIZATION, AND INTERFACES

The organizational structure, responsibilities, and interfaces associated with this project are discussed in this section.

2.1 OU 7-13/14 In Situ Grouting Project Organizational Structure

The key organizations required to complete this work scope are ID-EM and the ICP.

Organizational Structure

- Encompass ID-EM and ICP
- Incorporate key interfaces with various company organizations, regulatory agencies, and stakeholders.

2.1.1 U.S. Department of Energy

The basic framework of roles and responsibilities for program and project management at the various operating levels within the U.S. Department of Energy Headquarters (DOE-HQ) are consistent with ICP management systems and implementing requirements. Accordingly, line managers extending from the secretary of Energy to the deputy secretary and the undersecretary, the program secretarial officer, and the DOE-HQ program manager will be held responsible and accountable for developing, executing, and managing the project within the baseline (i.e., cost, schedule, and scope).

ID-EM has responsibility to maintain interfaces with regulatory agencies and stakeholders (see Section 2.3.1), and based on company, agency, and stakeholder input, will determine the path forward for ISG at the RWMC.

2.1.2 Clean/Close RWMC Management

The Clean/Close RWMC Project director executes ICP responsibility for WAG 7 projects and reports to the ICP vice president. The RWMC Operations manager has overall responsibility for day-to-day operation of the RWMC. The Clean/Close RWMC Project manager and RWMC Operations manager both report directly to the Clean/Close RWMC Project director.

The Clean/Close RWMC Project contains several subprojects (SPs); the OU 7-13/14 ISG Project is under SP-2. The OU 7-13/14 (SP-2) project manager has overall responsibility for project execution, budget, and schedule and is accountable to the customer and company management for meeting performance expectations.

The OU 7-13/14 ISG Project team is ultimately responsible for meeting the commitments of the ICP Clean/Close RWMC Project. Responsibilities include significant project interfaces, lines of authority, responsibilities, accountabilities, and communication.

2.1.3 OU 7-13/14 In Situ Grouting Project Team

Conceptual design is a distinct part of the OU 7-13/14 ISG Project—Phase Two and of the overall OU 7-13/14 ISG Project. As such, activities that support conceptual design may be performed by or coordinated with OU 7-13/14 ISG Project—Phase One or overall project personnel.

OU 7-13/14 ISG Project personnel and associated roles, as they pertain to conceptual design, include:

- **ISG Project cost account manager**, in addition to duties assigned by the OU 7-13/14 manager, is responsible for managing, coordinating, and administering conceptual design of the project

- **ISG Project engineer** provides management and coordination of engineering activities (e.g., design management, coordination, schedules, and budgets)

- **System engineer** provides RWMC structure, system, and component (SSC) engineering and configuration management support

- **Construction supervisor or field engineer** works with the ISG project engineer and conceptual design technical lead to arrange a field constructability review

- **RadCon engineer** provides overall technical expertise with respect to applicable radiological standards and practices and with ICP and INEEL procedures

- **Safety and health representative** performs and assists the conceptual design team to complete tasks related to compliance with applicable safety and health standards and ICP and INEEL procedures

- **Environmental lead** provides overall technical expertise with respect to regulatory issues, natural and cultural resources, and risk assessment.

2.2 Conceptual Design Team Organization and Responsibilities

The preliminary structure of the conceptual design team is shown in Figure 3. Those ancillary project positions and project interfaces not directly associated with conducting the conceptual design are not reflected in Figure 3 (see Sections 2.1 and 2.3). Roles and responsibilities for design team members illustrated in Figure 3 are summarized in the following subsections. Additionally, Section 4, "Project Work Strategies and Processes," describes certain engineering responsibilities and identifies the company controlled documents (e.g., procedures) used to meet those responsibilities.

2.2.1 ICP Engineering Services Department Manager

The ICP Engineering Services Department manager is the engineering home organization manager that provides trained, skilled, competent design engineers to support efficient, cost-effective, on-time completion of conceptual design engineering activities.

2.2.2 Conceptual Design Technical Lead

The conceptual design technical lead is responsible to the ISG project engineer for developing and maintaining the engineering task baseline for scope, cost, and schedule; for leading the engineering work execution effort of the design engineers, designers, and drafters; and for developing and issuing the resulting conceptual design report and associated project documentation.

2.2.3 Systems Engineer and Technical Writer

The systems engineer and technical writer provide as-needed support to the conceptual design technical lead to develop and issue the conceptual design report and associated project documentation.

2.2.4 Engineering Group Supervisors

Conceptual design engineering tasks will be conducted under the technical oversight of engineering group supervisors (EGSs). The EGSs are accountable to the ICP Engineering Services manager for maintaining scope, schedule, and budget and for the quality of the work their assigned personnel produce. The EGSs are aligned by discipline and are accountable to the conceptual design technical lead for the technical adequacy of the engineering products developed within their respective work organizations.

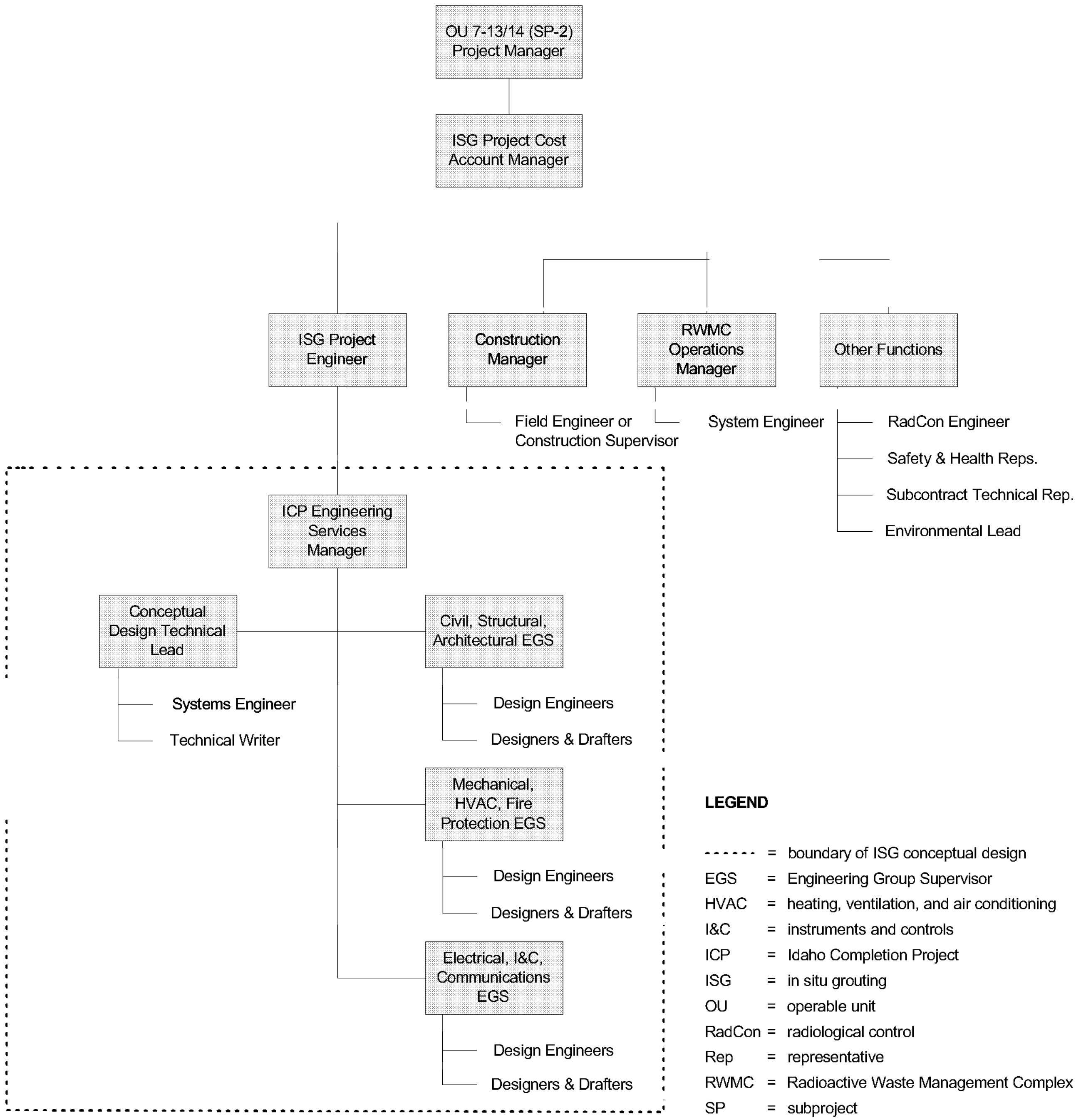

Figure 3. OU 7-13/14 In Situ Grouting Project—Phase Two conceptual design team organization chart.

2.2.5 Design Engineers

Discipline-specific design engineers, who report to their respective EGSs, will conduct conceptual design engineering activities. The design engineers are responsible for the technical adequacy of the engineering products they develop within their respective work organizations. The design engineers, who are assigned by the ICP Engineering Services Department manager, are accountable to the conceptual design technical lead for producing engineering products that meet project functional needs and requirements.

2.2.6 Designers and Drafters

Designers and drafters will assist the design engineers, as requested, to develop their engineering products.

2.3 Primary Interfaces

Successful accomplishment of the conceptual design will be dictated by the timely communication and effective cooperation of many parties. Some of these exist within the ICP organization and are driven by the same influences as the project organization. However, some are external to the company and the ICP. The OU 7-13/14 Project manager will orchestrate the interfacing relationships of these interested or affected stakeholders.

2.3.1 Agency Oversight and Stakeholder Interfaces

The following agencies have regulatory oversight responsibility for implementing the Federal Facility Agreement and Consent Order (FFA/CO) (DOE-ID 1991):

- State of Idaho Division of Environmental Quality (part of the Idaho Health and Welfare Department)
- U.S. Environmental Protection Agency (EPA), Region 10.

ID-EM has responsibility to maintain interfaces with regulatory agencies (e.g., State of Idaho and EPA) and stakeholders regarding the OU 7-13/14 ISG Project, which is being executed as a CERCLA, non-time-critical removal action. The company will develop an engineering evaluation/cost analysis (EE/CA) report that will document the proposed path forward for the OU 7-13/14 ISG Project. This report will receive agency and public review prior to issue. Based on the EE/CA report, DOE will issue an Action Memorandum, which will serve as the decision statement for path forward of ISG at the RWMC.

2.3.2 Research and Development Interface

INEEL research and development (R&D) organizations will provide as-needed support to conceptual design in the following areas:

- Development and delivery of technology to support project needs
- Topical input on technical issues and design objectives
- R&D studies
- Decision analysis support and facilitation

- Staffing support
- Independent technical reviews.

2.3.3 Idaho Completion Project Internal Interfaces

The conceptual design will require support from various organizations and disciplines within the ICP (such as quality assurance and planning and scheduling disciplines). Task baseline and interface agreements will be used as needed to obtain this support.

2.4 Communication

The conceptual design team will process and control correspondence that affects prime contract scope, cost, or schedule in compliance with applicable company processes and standards.

2.4.1 External Correspondence

The project administrative assistant controls official external correspondence (to and from non-company entities such as ID-EM) by:

- Receiving and distributing external correspondence
- Applying an INEEL correspondence control number and assigning or closing actions
- Formatting outgoing correspondence using applicable company format
- Routing a record copy to the records coordinator.

2.4.2 Internal Correspondence

The project administrative assistant controls official internal correspondence (to and from other company personnel) by:

- Assigning project-specific tracking numbers for internal correspondence on request by conceptual design team members
- Assigning a project-specific tracking number from the project letter log to internal correspondence to and from the ISG Project cost account manager
- Formatting correspondence using applicable company format.

2.4.3 Electronic Communications

The conceptual design team will control correspondence transmitted by fax and e-mail. Official correspondence transmitted by fax will be processed in the same manner as incoming and outgoing correspondence described in the previous subsections. The fax cover sheet and the correspondence will be filed together in the project files.

3. RESOURCE REQUIREMENTS

3.1 Acquisition Strategy

During conceptual design, a project acquisition plan, which is not part of the conceptual design, will be written to provide the necessary guidance to acquire goods and services throughout various project stages. Options for obtaining goods and services were identified during the preconceptual phase. The acquisition strategy will be developed more fully during and after conceptual design.

3.2 Procurement Strategy

The conceptual design team strategy is to ensure that the correct materials and services are available on schedule and within budget. The conceptual design effort will identify long-lead items. The procurement strategy considers the types of actions necessary to competitively acquire materials and services.

3.3 Support Services

Conceptual design support services will be provided primarily by existing company resources. ICP Central Engineering Services will provide engineering resources. These resources will be augmented as needed by deployed resources from other organizations, and when necessary, supplemented through staff augmentation utilizing blanket subcontract agreements.

3.4 Funding

Section 6, "Performance Baseline," provides the conceptual design cost baseline and addresses total conceptual design costs. Funding amounts identified in the cost baseline are needed to complete the conceptual design on schedule.

4. WORK STRATEGIES AND PROCESSES

Company personnel will provide project management, planning and controls, design engineering, procurement, construction management, and associated project services as necessary during conceptual design. In addition, project management will evaluate the need to use specialty engineering, staff augmentation, and other consultants on an as-needed basis. The decision to use company resources or commercial suppliers will be based on cost and schedule, and on maintenance or development of core competencies.

Work Strategies
• Describe how the project is managed through conceptual design • Perform engineering design activities in a uniform and consistent manner • Provide the necessary guidance to acquire goods and services during conceptual design • Consider the types of actions necessary to implement the competitive acquisition of goods and services to support conceptual design.

The project uses a coordinated work strategy 1 process management approach t accomplish conceptual design Existing administrative protocols infrastructure are used whenever possible.

4.1 Project Management Strategy and Processes

The project management strategy ensures safe, efficient, cost-effective, successful completion of the conceptual design.

4.1.1 General Project Management

The conceptual design team will implement the project management requirements, implementing instructions, and guidelines contained in the documents listed below through a graded application:

- PRD-4, "INEEL Project Management System Requirements"
- MCP-9106, "Management of INEEL Projects"
- GDE-70, "General Project Management Methods"
- INEEL/EXT-03-00387, "Idaho Completion Project, Project Execution Plan" (INEEL 2003a).

4.1.2 Conceptual Design Project Management Activities

Instructions for implementing project management activities are provided in MCP-9106. The conceptual design technical lead will perform the following activities:

- Provide leadership to the conceptual design team
- Define the conceptual design goals
- Establish roles, responsibilities, authorities, and accountabilities for each conceptual design team member

- Establish team protocol and communication methods and other administrative and logistic items (e.g., action tracking system, team location, and support equipment).

4.1.3 Value Engineering

Value engineering is applied to the conceptual design to evaluate the best process for satisfying functions to be accomplished and to identify potential life-cycle cost savings. The conceptual design team will use the value engineering guidance provided in GDE-70, as applicable.

4.1.4 Systems Engineering

Systems engineering discipline and principles are employed in the beginning and throughout conceptual design to identify, develop, and implement a design and process that will provide the essential functions and capability at the optimum life-cycle cost, consistent with required performance, scope, schedule, and cost. The systems engineering role will include functional analysis, requirements definition and management, risk identification and management, interface identification and management, alternatives analysis and decision-making, and integration and test planning.

4.2 Engineering Strategy and Process

The engineering strategy is to perform conceptual design activities in a uniform and consistent manner that meets project technical and functional requirements (T&FRs). Table 1 identifies the company procedures and processes in effect at the time of release of this revision of the conceptual design plan. The engineering team uses company procedures and processes in effect when the activity is being performed to deliver designs and products that meet requirements. GDE-70; MCP-2811, "Design Control"; MCP-3772, "Use of Commercial Grade Items in Safety Structures, Systems, and Components"; and PDD-1027, "Conduct of Engineering"; assist engineers in performing engineering activities in a cost-effective manner that reduces rework and the potential for errors.

When appropriate, design engineers will employ DOE-ID *Architectural Engineering Standards* (AE Standards) (DOE-ID 2002) to meet federal and industry design standards. When the AE standards are not appropriate for a particular project engineering activity, the conceptual design team will establish an exemption for that activity. The AE standards are available on the Electronic Document Management System (EDMS) or at http://www.inel.gov/publicdocuments/doe/archeng-standards.

Table 1. Engineering process roles and responsibilities matrix.

ISG Project Cost Account Manager	Project Engineer	Conceptual Design Technical Lead	System Engineer	Design Engineer
• Update risk management plan • Determine commercial practices (MCP-9106 and PLN-920) • Develop project cost estimate (MCP-2871) • Develop performance measurement methods • Manage scope, schedule, and cost changes (MCP-3416) • Identify trends (MCP-3805) • Prepare the acquisition plan (GDE-70) • Initiate the request for determination of safety analysis requirements (GDE-70) • Develop project execution plan	• Provide engineering oversight and direction to engineering activities • Develop and execute the project's technical work scope • Provide progress reporting on project technical work scope • Develop technical and function requirements (MCP-9185) • Identify engineering issues and propose resolutions to project management	• Manage the design process • Determine whether a registered professional engineer is required (MCP-3534) • Determine design verification method (MCP-9217) • Prepare CDR • Develop conceptual design work package • Provide technical guidance and requirement interpretation • Coordinate preparation of deliverables	• Prepare engineering change form(s) (MCP-2811) • Complete technical risk screen(s) (MCP-2811) • Identify configuration-managed SSCs (MCP-2811) • Determine safety category (MCP-540)	• Perform value engineering to evaluate alternatives (GDE-70) • Perform design analysis (Form 431.02 and MCP-2374) • Determine safeguards and security requirements (MCP-9185) • Develop engineering drawings (MCP-2377)

CDR = conceptual design report
Form 431.02, "Engineering Design File"
GDE-70, "General Project Management Methods"
MCP-540, "Documenting the Safety Category of Structures, Systems, and Components"
MCP-2374, "Analyses and Calculations"
MCP-2377, "Development, Assessment, and Maintenance of Drawings"
MCP-2811, "Design Control"
MCP-2871, "Estimating Project Costs"
MCP-3416, "Baseline Change Control"
MCP-3534, "Use of Registered Professional Engineers"
MCP-3805, "Trend Programs"
MCP-9106, "Management of INEEL Projects"
MCP-9185, "Technical and Functional Requirements"
MCP-9217, "Design Verification"
PLN-920, "Project and Construction Management Quality Program Plan"

5. CONSTRUCTION STRATEGY AND PROCESSES

The ISG Project cost account manager involves the construction management team as early as possible in the project cycle to ensure good schedule planning, acquisition strategy, initial hazards review, and economy of construction (constructability). Construction management processes described in the following subsections are implemented during conceptual design.

5.1 Constructability Review

During conceptual design, a construction supervisor or field engineer will work with the ISG project engineer and conceptual design technical lead to arrange a field constructability review in accordance with MCP-9106 and using GDE-51, "Construction Project Management Guide." During the field constructability review, project team members conduct the preliminary hazards review, identify any unique conditions associated with the construction site, and verify suitability of the site for project construction. The field constructability review gives the project team the opportunity to provide design inputs before the start of final design. The ISG project engineer ensures that results from the field constructability review are incorporated into the final design.

5.2 Commercial Practices

A conceptual design review is performed to determine the appropriate commercial practices to apply to construction execution. The nine-block matrix described in MCP-9106 and shown in Table 2 will be used to evaluate operations interfaces and construction safety risk.

5.3 Construction Schedule

As part of the conceptual design, the construction management team will prepare a preliminary construction schedule to incorporate into the overall project schedule and assist project management with development of the construction strategy.

Table 2. Commercial practices graded application matrix.

Operations Interface Factors	Construction Safety Risk Factors: High	Medium	Low
Maximum	1 • Prequalified contractor • STD-101, "Integrated Work Control Process," Chapter 6 • Level II LO/TO trained[a] • Full SRM • Full-time surveillance • Daily authorization, POD	2 • Prequalified contractor • STD-101, Chapter 6 • Level II LO/TO trained[a] • Full SRM • Part-time surveillance • Daily authorization, POD	3 • Prequalified contractor • STD-101, Chapter 6 • Selected SRM chapters • Part-time surveillance • Daily authorization, POD
Moderate	4 • Prequalified contractor • STD-101, Chapter 6 • Level II LO/TO trained[a] • Full SRM • Full-time surveillance • Daily authorization, POD	5 • Prequalified contractor • STD-101, Chapter 6 • Level II LO/TO trained[a] • Select SRM • Part-time surveillance • Daily authorization, POD	6 • STD-101, Chapter 6 • Part-time surveillance • Daily authorization, POD • Contractor work processes approved by the company
Minimum	7 • Prequalified contractor • Level II LO/TO trained[a] • Full SRM • Full-time surveillance	8 • Selected SRM chapters • Part-time surveillance • Contractor work processes approved by the company	9 • Part-time surveillance • Contractor work processes approved by the company

a. In accordance with MCP-3651, "Chapter IX Level II Lockouts and Tagouts."
LO/TO = lockout/tagout
POD = plan of the day
SRM = *Subcontractor Requirements Manual* (TOC-59)
STD = standard

6. PERFORMANCE BASELINE

6.1 Technical Baseline

Technical requirements for project conceptual design are discussed and the major project deliverables identified in this section. The technical baseline consists of the work breakdown structure (WBS) and planned project deliverables.

> **Planning and Controls**
>
> - Maintain a detailed technical baseline, which includes project scope and technical and functional requirements
> - Develop and maintain a detailed schedule
> - Maintain a baseline cost estimate and work breakdown structure
> - Monitor performance against baselines.

6.1.1 Scope Summary and Basis

Objectives of the OU 7-13/14 ISG Project—Phase Two are as follows:

- Mobilize and prepare equipment
- Grout LLW soil vaults, pits, and trenches in the RWMC SDA.

The grouting system is currently envisioned as a mobile building or buildings, an off-Site grout delivery system, a grouting system, well drilling and grouting equipment, an off-gas system, and a radioactive contamination control system with associated equipment.

6.1.2 Technical and Functional Requirements

The project team will prepare a T&FR document in accordance with MCP-9185, "Technical and Functional Requirements." The T&FR document will identify and record the T&FRs, including the technical basis and associated performance requirements, necessary to execute the design process. The ISG project engineer is responsible for T&FR document content and approval. The project team will update the T&FR document as needed.

6.1.3 Work Breakdown Structure

The objective of the conceptual design WBS is to subdivide the total conceptual design effort into manageable units of work for effective planning and control (see Appendix A). In the WBS, work is subdivided into successively lower levels of detail. Each successive level consists of elements that identify the scope of that element. Each lower level is a meaningful subdivision of a higher element.

6.1.4 Document Deliverables

The conceptual design report (CDR) is the primary conceptual design team deliverable. The CDR will be structured and formatted using the company CDR outline, which is available from the ICP Engineering Services homepage (http://ae.inel.gov/). Other deliverables may be developed as needed to support the CDR and the overall conceptual design effort.

6.2 Scheduling

The project team develops and maintains a detailed schedule in accordance with present ICP Central Engineering Services work practices. Level 4 and 5 working schedules are developed using

Pimavera software. These schedules are independent of the company detailed work plan (DWP), but roll down from the DWP level 3 schedules.

The planning and controls representative has performed the following conceptual design scheduling actions:

- Assigned resource data based on conceptual design team input to the scheduling software to schedule activities and generate reports (see Appendix B for the conceptual design schedule)

- Loaded schedule data from scheduling software into the ICP Central Engineering Services Resource Management System (RMS) cost tracking and pricing tool

- Generated various cost and resource reports from the pricing software for the project team to review and use to analyze resource availability and budget.

The conceptual design team uses these reports to analyze resource availability and budgets, and then reports earned value to the ISG Project cost account manager.

6.3 Cost Baseline

The project team developed an estimated conceptual design cost breakdown, which is provided in Appendix C. Based on each level of the conceptual design, the WBS was estimated to arrive at a total conceptual design cost.

7. RISK MANAGEMENT

Risk is the degree of exposure to an event that might cause detriment or benefit to a program, project, or activity. Risk management is the process that is structured to eliminate or mitigate potential adverse impacts to a project as well as to enhance potential positive outcomes.

Risk Management Plan

- Help project personnel focus on areas of concern and make informed decisions.

Risk Management Processes

- Follow a structured process to handle the potential impact risk could have on the project
- Include risk management elements that form the basis of the risk management plan.

7.1 Risk Management Plan

The conceptual design team will input information into a detailed risk management plan for the project to effectively focus on areas of concern and make informed decisions.

7.2 Risk Management Process

The conceptual design team will follow proven, effective processes to assess and manage risk. Risks will be identified, analyzed, and managed throughout the conceptual design.

8. PROJECT CONTROLS

8.1 Work Authorization

The conceptual design team will prepare a work authorization agreement to employ the company work authorization process, and will only perform work that has been authorized in an approved DWP or baseline change proposal (BCP).

In addition, the ISG Project cost account manager controls issuance of charge numbers to ensure that only authorized work is performed. Instructions are provided to individual performers when charge numbers are assigned to further ensure accurate charging practices.

8.2 Performance Monitoring

8.2.1 Schedule Performance

Conceptual design schedule performance will be measured based on physical work accomplished. Percent complete will be measured based on performance as determined by the conceptual design technical lead and conceptual design team in accordance with established earned value techniques.

8.2.2 Cost Performance

Conceptual design cost performance will be tracked. Planning and controls personnel will prepare reports documenting cost actuals. The reports will include authorized funding and weekly, monthly, and year-to-date actuals in dollars and hours.

8.2.3 Variance Analysis

Variance analysis will be performed monthly for year-to-date performance on the conceptual design. This analysis will include the identification of cause, potential impacts, and corrective actions.

Conceptual design resource use variances will be analyzed to identify resource shortages and to determine whether functional management must be notified of needs, shortages, or overages.

8.2.4 Estimates at Completion

The conceptual design technical lead will develop monthly estimates at completion (EACs) for the conceptual design. Identified trends and activity completion dates will be used to develop the EACs.

8.2.5 Thresholds

The project team identifies ICP thresholds in accordance with MCP-3822, "Performance Measurement, Analysis, Estimates at Completion, and Reporting."

8.2.6 Reporting

The conceptual design team will provide the ISG Project cost account manager with weekly detailed project reports, which include conceptual design status, progress, and issues.

9. DOCUMENT AND RECORDS MANAGEMENT

The conceptual design team will employ established company document and records management systems, processes, and procedures. Project conceptual design records are also processed and managed, as applicable, in accordance with the FFA/CO (DOE-ID 1991). This ensures those records are created as specified and managed to protect against loss, damage, destruction, and unauthorized access or removal.

Document and Records Management

- Manage, process, and store project documents and records in accordance with current established practices
- Provide resources, procedures, and personnel.

The Document Management Control System (DMCS) is the approved company system for processing controlled documents (e.g., procedures, plans, and guides). This document control process is directed by MCP-135, "Creating, Modifying, and Canceling Procedures and Other DMCS Controlled Documents." This process provides a consistent approach to planning, developing, reviewing, changing, and approving controlled documents.

Conceptual design records will be retained and made readily accessible in accordance with company and project requirements. Record copies of pertinent conceptual design documents will be stored electronically in the companywide EDMS (http://edms.inel.gov/) (INEEL 2003b). This system complies with the requirements of the FFA/CO; implements MCP-557, "Managing Records"; and provides a long-term stewardship baseline. For the duration of the project, the project administrator will also retain copies of conceptual design records in project files located in the Technical Support Building B (TSB).

The records coordinator is responsible for methodically and uniformly processing project records. The records coordinator also verifies that conceptual design records are complete before they are submitted to document control, the Administrative Record and Information Repository (AR/IR), and the EDMS. In addition, the records coordinator verifies required retention periods.

The project administrator sets retention periods for conceptual design records as specified in LST-9, "INEEL Records Schedule Matrix." The records management process is illustrated in Figure 4.

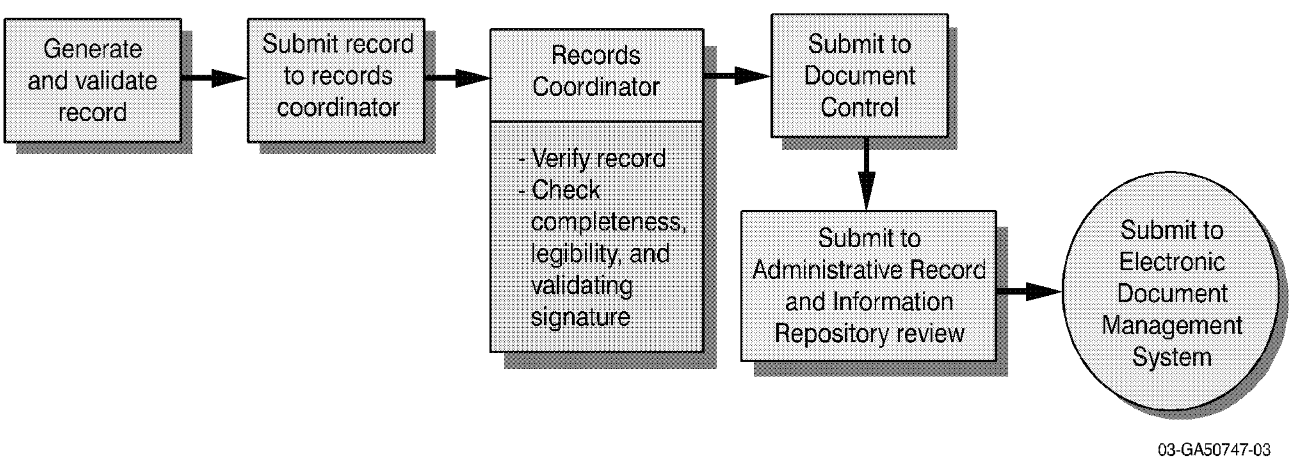

Figure 4. Project records management process.

10. ENVIRONMENTAL, SAFETY, AND HEALTH

This section outlines the systems, processes, and roles and responsibilities of conceptual design team members for protecting the environment, employees, and the public from conceptual design effects or outcomes that apply to environmental protection, radiological control, safety, and health.

> **Environmental, Safety, and Health**
>
> - Satisfy applicable or relevant and appropriate requirements
> - Protect human health and the environment
> - Fully embrace Integrated Safety Management.

10.1 Environmental Protection

The conceptual design team will satisfy environmental protection external and internal company requirements. Companywide Manual 8, *Environmental Protection and Compliance,* documents the company Environmental Protection Program. Responsibilities for implementing the program are defined in a number of environmental program requirements documents and implementing procedures contained in Manual 8.

10.2 Radiological Control

The radiological control program for the company is documented in companywide Manual 15A, *Radiation Protection–INEEL Radiological Control Manual*. The conceptual design technical lead has overall radiological control responsibility for the conceptual design. The project team includes radiological control professionals who will advise the conceptual design team on maintaining compliance with the Radiological Control Program and associated implementing procedures.

10.3 Safety and Health Control

The project fully embraces the Integrated Safety Management System (ISMS) in both core functions and guiding principles. In addition, the conceptual design team embodies the strong safety management culture inherent in all company activities and will manage safety and health as a critical component of the design team approach.

All personnel are responsible for safely performing work related to this project. To this end, conceptual design planning, administrative and engineered controls, and technical execution of work address issues to achieve environmental protection, radiological control, and the safety and health of workers and the public. Conceptual design activities will be performed according to approved company procedures for radiation protection, industrial hygiene, and industrial safety.

Conceptual design tasks will be reviewed for safety and health concerns by industrial safety and/or industrial hygiene representatives and appropriate radiological control personnel. The conceptual design team will comply with and implement the applicable safety and health requirements, implementing instructions, and guidelines contained in the following companywide manuals:

- Manual 14A, *Safety and Health– Occupational Safety and Fire Protection*
- Manual 14B, *Safety and Health– Occupational Medical and Industrial Hygiene.*

11. SAFEGUARDS AND SECURITY

Effective processes to protect facilities, information, and nuclear material have been developed by company Safeguards and Security Program personnel in accordance with DOE Order 473.1, "Physical Protection Program" (DOE 2002). These processes are fully implemented and documented in the following companywide manuals:

- Manual 11A, *Safeguards and Security–Program Management*
- Manual 11B, *Safeguards and Security–Protection Program Operations*
- Manual 11C, *Safeguards and Security–Information Security*
- Manual 11D, *Safeguards and Security–Nuclear Materials Control and Accountability*
- Manual 11E, *Safeguards and Security–Personnel Security*.

Safeguards and Security

- Identifies security requirements for conceptual design
- Complies with and implements security requirements.

The conceptual design team will comply with and implement the applicable safeguards and security requirements, implementing instructions, and guidelines contained in the aforementioned manuals. The conceptual design team will protect and control safeguards and security interests to preclude unauthorized access, unauthorized disclosure, loss, destruction, unauthorized modification, theft, compromise, and misuse of project facilities, information, and nuclear material in accordance with company safeguards and security procedures and project planning documents.

12. QUALITY ASSURANCE

The company Quality Assurance Program is documented in the following companywide documents and manuals:

- PLN-694, "Environmental Restoration Project Management Plan"
- Manual 13A, *Quality and Requirements Management Program Documents*
- Manual 13B, *Quality and Requirements Management Procedures*
- MCP-540, "Documenting the Safety Category of Structures, Systems and Components."

Quality Assurance

- Meet requirements bases for the conceptual design at the appropriate risk level
- Verify appropriate application of safety category for the project
- Adhere to applicable quality program requirements.

The conceptual design team will comply with and implement the applicable quality assurance requirements, implementing instructions, and guidelines contained in the aforementioned manuals and documents.

13. REFERENCES

The company controlled documents (e.g., procedures, guides, and standards) and other INEEL and ICP documents (e.g., external reports) that are referenced in this conceptual design plan and listed below are available on the Electronic Document Management System (EDMS; http://edms.inel.gov/).

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Appendix A

Conceptual Design Work Breakdown Structure

Appendix A

Conceptual Design Work Breakdown Structure

This appendix contains the conceptual design work breakdown structure (WBS) for the OU 7-13/14 In Situ Grouting Project—Phase Two, as of the issue date for the current revision of this plan. The following list contains the acronyms used within the conceptual design WBS:

CDR	conceptual design report
EDF	engineering design file
EGS	engineering group supervisor
HVAC	heating, ventilating, and air conditioning
I&C	instrumentation and control
ORB	Operational Review Board
RCC	radiation and contamination control
T&FR	technical and functional requirement
VE	value engineering

BB-02 VE Session, T&FR Support, and Studies

- BB-02.1 VE Session
- BB-02.2 Studies
  - BB-02.2.1 Civil Studies
  - BB-02.2.2 Fire Protection Studies
  - BB-02.2.3 Electrical Studies
  - BB-02.2.4 Architectural Studies
  - BB-02.2.5 Structural Studies
  - BB-02.2.6 Process Studies
  - BB-02.2.7 HVAC Studies
  - BB-02.2.8 I&C Studies
  - BB-02.2.9 Mechanical Utilities Studies
  - BB-02.2.10 Mechanical Equipment Studies
  - BB-02.2.11 RCC Studies
- BB-02.3 Alternatives Studies
  - BB-02.3.1 Civil Alternatives Studies

BB-02.3.2 Fire Protection Alternatives Studies

BB-02.3.3 Electrical Alternatives Studies

BB-02.3.4 Architectural Alternatives Studies

BB-02.3.5 Structural Alternatives Studies

BB-02.3.6 Process Alternatives Studies

BB-02.3.7 HVAC Alternatives Studies

BB-02.3.8 I&C Alternatives Studies

BB-02.3.9 Mechanical Utilities Alternatives Studies

BB-02.3.10 Mechanical Equipment Alternatives Studies

BB-02.3.11 RCC Alternatives Studies

BB-02.4 T&FR Support

BB-02.4.1 Civil Design Requirements

BB-02.4.2 Fire Protection Design Requirements

BB-02.4.3 Electrical Design Requirements

BB-02.4.4 Architectural Design Requirements

BB-02.4.5 Structural Design Requirements

BB-02.4.6 Process Design Requirements

BB-02.4.7 HVAC Design Requirements

BB-02.4.8 I&C Design Requirements

BB-02.4.9 Mechanical Utilities Design Requirements

BB-02.4.10 Mechanical Equipment Design Requirements

BB-02.4.11 RCC Design Requirements

BB-02.4.12 T&FR Review and Approval

BB-03 CDR Engineering Design and Drafting

BB-03.1 Site Development Architectural Design

BB-03.2 Drawings

BB-03.2.1 Civil Drawings

BB-03.2.2 Fire Protection Drawings

BB-03.2.3 Electrical Drawings

BB-03.2.4 Architectural Drawings

BB-03.2.5 Architectural Building Model

BB-03.2.6 Structural Drawings

BB-03.2.7 Process Drawings

BB-03.2.8 HVAC Drawings

BB-03.2.9 I&C Drawings

BB-03.2.10 Mechanical Utilities Drawings

BB-03.2.11 Mechanical Equipment Drawings

BB-03.2.12 RCC Drawings

BB-03.3 Descriptions

BB-03.3.1 Civil Descriptions

BB-03.3.2 Fire Protection Descriptions

BB-03.3.3 Electrical Descriptions

BB-03.3.4 Architectural Descriptions

BB-03.3.5 Structural Descriptions

BB-03.3.6 Process Descriptions

BB-03.3.7 HVAC Descriptions

BB-03.3.8 I&C Descriptions

BB-03.3.9 Mechanical Utilities Descriptions

BB-03.3.10 Mechanical Equipment Descriptions

BB-03.3.11 RCC Descriptions

BB-03.4 Identification of Long Lead Items

BB-03.4.1 Civil Long Lead Items

BB-03.4.2 Fire Protection Long Lead Items

BB-03.4.3 Electrical Long Lead Items

BB-03.4.4 Architectural Long Lead Items

BB-03.4.5 Structural Long Lead Items

BB-03.4.6 Process Long Lead Items

BB-03.4.7 HVAC Long Lead Items

BB-03.4.8 I&C Long Lead Items

BB-03.4.9 Mechanical Utilities Long Lead Items

BB-03.4.10 Mechanical Equipment Long Lead Items

BB-03.4.11 RCC Long Lead Items

BB-03.5 Compiling CDR and EDFs

BB-04 Reviews and Comment Incorporation

BB-04.1 CDR EGS Checking

BB-04.2 Resolution of EGS CDR Comments

BB-04.3 CDR ORB Review

BB-04.4 Resolution of ORB CDR Comments

BB-04.5 Finalizing CDR

BB-04.6 Printing CDR

BB-05 Project Support and Coordination

BB-05.1 Project Engineering

BB-05.2 CDR Cost Estimates

BB-05.3 Planning and Scheduling

BB-05.4 Construction Support

BB-05.5 Miscellaneous Support

Appendix B

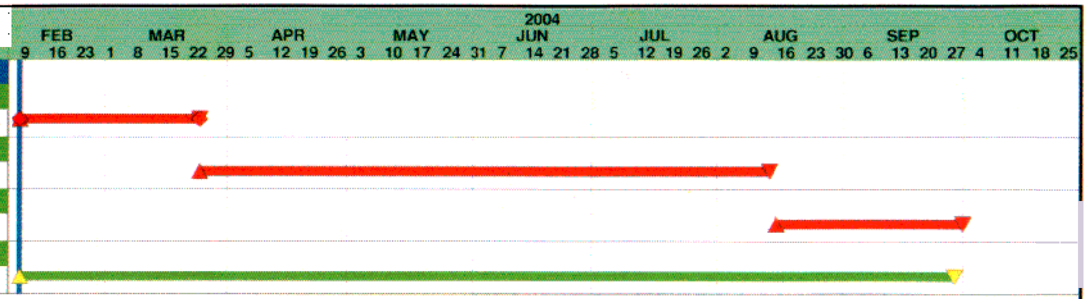
Conceptual Design Schedule

Appendix B

Conceptual Design Schedule

This appendix contains the conceptual design schedule for the OU 7-13/14 ISG Project—Phase Two, as of January 22, 2004.

Activity ID	Activity Description	Orig Dur	Early Start	Early Finish
RWMC-ISG Grouting Conceptual Design				
- VE Session, T&FR Support and Studies				
		33	09FEB04	24MAR04
- CDR Engineering Design and Drafting				
		100	25MAR04	13AUG04
- Review and Comment Incorporation				
		33	16AUG04	30SEP04
- Project Support and Coordination				
		164	09FEB04	28SEP04



Start Date 09FEB04
Finish Date 30SEP04
Data Date 09FEB04
Run Date 22JAN04 09:36

Early Bar
Progress Bar
Critical Activity

4PDA - IF43

Sheet 1 of 1

INEEL - RWMC

RWMC-ISG Grouting Conceptual Design

Classic Schedule Layout

Date	Revision	Checked	Approved

Appendix C

Conceptual Design Cost Breakdown

Appendix C

Conceptual Design Cost Breakdown

This appendix contains the conceptual design estimated cost breakdown for the OU 7-13/14 ISG Project—Phase Two, as of the issue date for the current revision of this plan.

Anderson, Ed

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-05	PROJECT COORDINATION AND SUPPORT	2/9/2004	9/28/2004	167	G00	LOE	97.00	Hrs
BB-04	Reviews and Comment Incorporation	8/16/2004	9/30/2004	34	M03	Active	24.00	Hrs

Total Non-Labor: $ 0.00 Total Labor: 121.00

Balls, Vondell

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-05	PROJECT COORDINATION AND SUPPORT	2/9/2004	9/28/2004	167	G00	LOE	60.00	Hrs
BB-04	Reviews and Comment Incorporation	8/16/2004	9/30/2004	34	S03	Active	16.00	Hrs

Total Non-Labor: $ 0.00 Total Labor: 76.00

Blakely, Byron L.

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-03	CDR Engineering Design and Drafting	3/25/2003	8/13/2004	364	A05	Active	360.00	Hrs
BB-04	Reviews and Comment Incorporation	8/16/2004	9/30/2004	34	A03	Active	90.00	Hrs
BB-02	VE Session, T&FR Support and Studies	2/9/2004	3/24/2004	33	A01	Active	150.00	Hrs

Total Non-Labor: $ 0.00 Total Labor: 600.00

Bunnell, Paul

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-03	CDR Engineering Design and Drafting	3/25/2003	8/13/2004	364	E01	Active	360.00	Hrs
BB-04	Reviews and Comment Incorporation	8/16/2004	9/30/2004	34	E03	Active	100.00	Hrs
BB-02	VE Session, T&FR Support and Studies	2/9/2004	3/24/2004	33	E01	Active	165.00	Hrs

Total Non-Labor: $ 0.00 Total Labor: 625.00

Chemical Engineer

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-03	CDR Engineering Design and Drafting	3/25/2003	8/13/2004	364	X05	Active	384.00	Hrs
BB-04	Reviews and Comment Incorporation	8/16/2004	9/30/2004	34	X03	Active	96.00	Hrs
BB-02	VE Session, T&FR Support and Studies	2/9/2004	3/24/2004	33	X01	Active	160.00	Hrs

Total Non-Labor: $ 0.00 Total Labor: 640.00

Clark, Doug

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-03	CDR Engineering Design and Drafting	3/25/2003	8/13/2004	364	M05	Active	168.00	Hrs
BB-04	Reviews and Comment Incorporation	8/16/2004	9/30/2004	34	M03	Active	42.00	Hrs
BB-02	VE Session, T&FR Support and Studies	2/9/2004	3/24/2004	33	M01	Active	70.00	Hrs

Total Non-Labor: $ 0.00 Total Labor: 280.00

Cost and Scheduling

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-05	PROJECT COORDINATION AND SUPPORT	2/9/2004	9/28/2004	167	G02	LOE	200.00	Hrs

Total Non-Labor: $ 0.00 Total Labor: 200.00

Eastman, Randy

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-03	CDR Engineering Design and Drafting	3/25/2003	8/13/2004	364	M05	Active	500.00	Hrs
BB-04	Reviews and Comment Incorporation	8/16/2004	9/30/2004	34	M03	Active	124.00	Hrs
BB-02	VE Session, T&FR Support and Studies	2/9/2004	3/24/2004	33	M01	Active	210.00	Hrs

Total Non-Labor: $ 0.00 Total Labor: 834.00

Environmental Engineer

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-03	CDR Engineering Design and Drafting	3/25/2003	8/13/2004	364	02.01	Active	44.00	Hrs
BB-04	Reviews and Comment Incorporation	8/16/2004	9/30/2004	34	02.01	Active	60.00	Hrs
BB-02	VE Session, T&FR Support and Studies	2/9/2004	3/24/2004	33	02.01	Active	80.00	Hrs

Total Non-Labor: $ 0.00 Total Labor: 184.00

Graff, Kenneth E.

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-03	CDR Engineering Design and Drafting	3/25/2003	8/13/2004	364	E01	Active	360.00	Hrs
BB-04	Reviews and Comment Incorporation	8/16/2004	9/30/2004	34	E03	Active	98.00	Hrs
BB-02	VE Session, T&FR Support and Studies	2/9/2004	3/24/2004	33	E01	Active	165.00	Hrs

Total Non-Labor: $ 0.00 Total Labor: 623.00

Jensen, Chris

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-03	CDR Engineering Design and Drafting	3/25/2003	8/13/2004	364	M05	Active	495.00	Hrs
BB-04	Reviews and Comment Incorporation	8/16/2004	9/30/2004	34	M03	Active	124.00	Hrs
BB-02	VE Session, T&FR Support and Studies	2/9/2004	3/24/2004	33	M01	Active	200.00	Hrs

Total Non-Labor: $ 0.00 Total Labor: 819.00

Mace, Gene K.

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-05	PROJECT COORDINATION AND SUPPORT	2/9/2004	9/28/2004	167	G00	LOE	50.00	Hrs
BB-04	Reviews and Comment Incorporation	8/16/2004	9/30/2004	34	M03	Active	40.00	Hrs

Total Non-Labor: $ 0.00 Total Labor: 90.00

Moncur, Jim L.

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-03	CDR Engineering Design and Drafting	3/25/2003	8/13/2004	364	M05	Active	920.00	Hrs
BB-04	Reviews and Comment Incorporation	8/16/2004	9/30/2004	34	M03	Active	80.00	Hrs
BB-02	VE Session, T&FR Support and Studies	2/9/2004	3/24/2004	33	M01	Active	80.00	Hrs

Total Non-Labor: $ 0.00 Total Labor: 1,080.00

Rad Safe Engineer

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-03	CDR Engineering Design and Drafting	3/25/2003	8/13/2004	364	02.01	Active	200.00	Hrs
BB-04	Reviews and Comment Incorporation	8/16/2004	9/30/2004	34	02.01	Active	75.00	Hrs
BB-02	VE Session, T&FR Support and Studies	2/9/2004	3/24/2004	33	02.01	Active	125.00	Hrs

Total Non-Labor: $ 0.00 Total Labor: 400.00

Reed, Bill

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-05	PROJECT COORDINATION AND SUPPORT	2/9/2004	9/28/2004	167	G00	LOE	66.00	Hrs
BB-04	Reviews and Comment Incorporation	8/16/2004	9/30/2004	34	E03	Active	20.00	Hrs

Total Non-Labor: $ 0.00 Total Labor: 86.00

Rogers, Kim

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-05	PROJECT COORDINATION AND SUPPORT	2/9/2004	9/28/2004	167	G01	LOE	420.00	Hrs

Total Non-Labor: $ 0.00 Total Labor: 420.00

Shepherd, Scott W.

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-05	PROJECT COORDINATION AND SUPPORT	2/9/2004	9/28/2004	167	G00	LOE	146.00	Hrs

Total Non-Labor: $ 0.00 Total Labor: 146.00

Stephens, David L.

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-03	CDR Engineering Design and Drafting	3/25/2003	8/13/2004	364	S05	Active	360.00	Hrs
BB-04	Reviews and Comment Incorporation	8/16/2004	9/30/2004	34	S03	Active	90.00	Hrs
BB-02	VE Session, T&FR Support and Studies	2/9/2004	3/24/2004	33	S01	Active	150.00	Hrs

Total Non-Labor: $ 0.00 Total Labor: 600.00

System Engineer

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-03	CDR Engineering Design and Drafting	3/25/2003	8/13/2004	364	02.01	Active	160.00	Hrs
BB-04	Reviews and Comment Incorporation	8/16/2004	9/30/2004	34	02.01	Active	40.00	Hrs
BB-02	VE Session, T&FR Support and Studies	2/9/2004	3/24/2004	33	02.01	Active	80.00	Hrs

Total Non-Labor: $ 0.00 Total Labor: 280.00

Technical Support

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-03	CDR Engineering Design and Drafting	3/25/2003	8/13/2004	364	02.01	Active	60.00	Hrs
BB-04	Reviews and Comment Incorporation	8/16/2004	9/30/2004	34	02.01	Active	20.00	Hrs

Total Non-Labor: $ 0.00 Total Labor: 80.00

Technical Writer

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-03	CDR Engineering Design and Drafting	3/25/2003	8/13/2004	364	02.01	Active	80.00	Hrs
BB-04	Reviews and Comment Incorporation	8/16/2004	9/30/2004	34	02.01	Active	80.00	Hrs

Total Non-Labor: $ 0.00 Total Labor: 160.00

Word Processing

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-05	PROJECT COORDINATION AND SUPPORT	2/9/2004	9/28/2004	167	G00	LOE	113.00	Hrs

Total Non-Labor: $ 0.00 Total Labor: 113.00

zz-Functional Mgmt

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-05	PROJECT COORDINATION AND SUPPORT	2/9/2004	9/28/2004	167	G00	LOE	43.00	Hrs

Total Non-Labor: $ 0.00 Total Labor: 43.00

zz-Non-Labor

Task Id	Task Descriptio	Start	End	Days	Admin Code	Status	Estimate	Estimating Units
BB-05	PROJECT COORDINATION AND SUPPORT	2/9/2004	9/28/2004	167	NL00	LOE	20,000.00	Hrs

Total Non-Labor: $ 20,000.00 Total Labor: 20,000.00

Subtotal Cost $ 500,808 Contingency: $ 0.00 Total Estimated Cost: $ 500,808

Grand Total Non-Labor: $ 20,000.00 Grand Total Hours: 8,500.00